



# Onion disorder: Soft rot

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Bacterial decay, known as soft rot, is one of the most widespread and destructive storage diseases of onion. Soft rot generally starts in the field just before or during harvest. The disease caused by the bacterium *Erwinia carotovora* subsp. *carotovora*, causes serious losses to onions that have been wounded in the field or improperly handled and stored.

Bacterial soft rot attacks nearly every known fruit, fleshy tuber, root, and succulent bud or stem of most vegetable crops.

## Symptoms and effects

Onion bulbs in the field may be affected before harvest, but infected bulbs usually go unnoticed until after harvest. Bacterial soft rot usually starts at the neck of the bulb, and progresses downward along one or more scales. At first the tissue is water-soaked. Later it disintegrates into a soft, slimy mass. The decay does not spread readily from scale to scale. One or two scales may be completely rotted while the remainder are sound. Eventually, the diseased bulbs can be detected by gently squeezing them, whereupon a watery fluid is exuded. An offensive sulfurous odor is usually associated with the liquid.

## Disease cycle

Soft rot bacteria commonly exist in the soil and plant refuse. They enter onions through wounds and aging tissue under moist conditions. Excessive irrigation during hot weather seems to favor a high incidence of soft rot.

Onion maggots are particularly effective at spreading the disease.

They feed on bulbs, creating wounds for the bacteria to enter. The bacteria may persist in the intestinal tract of the onion maggot larvae and adult flies and thus can be carried from one place to another. Other sources of wounds that create entry areas for the bacteria include hail damage to leaves and developing bulbs, sunscald, and freezing. During harvest, the practice of cutting the onion tops creates openings for the bacteria. Also, bruising or other damage from mechanical activity leaves bulbs susceptible to infection, particularly if they are stored in warm, humid conditions.

## Control

The first step in controlling soft rot is to control other diseases and avoid injury to the plants. This includes controlling insects such as the onion maggot that wound plants and transmit the bacteria.

Allow the crop to mature completely before harvesting so that the neck areas are dried and provide a barrier for bacterial movement from infected leaves to the bulbs. The tops should be dried out as much as possible after lifting and before topping. Mechanical toppers that cut the neck about 1/2 inch above the bulb should be designed to minimize bruising. Roller toppers should not be used since they rip and tear the neck leaves. At all stages of harvest and storage, onions should be handled carefully to avoid bruising.

Cure bulbs thoroughly so that the outer scales and neck tissues are completely dry. This is usually



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done with forced air in storage bins. Remove bulbs that show any sign of disease or injury before storage.

There are no soft rot resistant onion varieties available.

Storms with hard rains, high winds, and hail cause wounds on leaves and bulbs that serve as entry points for bacteria. If these wounds are protected within hours after they occur with sprays containing copper-based materials, the wounds will likely heal rapidly and infection will be reduced. Treatments made after symptoms appear will not control bacterial soft rot.



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